

Bally® PROFESSIONAL arcade™



Owner's Manual

IMPORTANT

**Do not block vents by operating
this unit on a carpeted surface.
Heat build up may result in
component failure.**

from **ASTROVISION INC.**

(This Page Intenionally Left Blank)

BALLY PROFESSIONAL ARCADE

With the Bally Professional Arcade, you and your friends will enjoy hours of entertainment. It is equipped with a variety of unique features including remote game selection, full color graphics, electronic music and much, much more!

Four programs have been included with your Arcade. A variety of exciting Videocade game cartridges are also available which you can purchase to increase your enjoyment of the Arcade. Or, learn to make your own games, electronic music and video art with the Bally Basic Computer Learning Lab.

Published by The Image Producers, Inc.
for
Astrovision, Inc.
6460 Busch Blvd., Suite 215
Columbus, OH 43229
April 1981

Copyright © 1981 Astrovision, Inc.
All Rights Reserved.

CONTENTS	PAGE
General Safeguards	4
FCC Regulations	5
Bally Professional Arcade	5
TV/Game Switch Box	6
300 OHM Installation	6
75 OHM Installation	7
Connecting Arcade to TV Receiver	7
Connecting Hand Controls	8
Channel Selector	8
Switching on Arcade and TV	9
Adjusting TV Screen	9
Arcade Warm Up Instruction	9
Main Menu Selection	9
Hand Control Operation	10
Remote Game Selection	11
Television Tube Protection Circuit	12
Pause	12
User-Programmable Game Time	12
Built-In Program Instructions	12
Gunfight	13
Checkmate	14
Scribbling	15
Calculator	16
Inserting Videocade Cartridges	17
In Case of Difficulty	19

GENERAL SAFEGUARDS

1. Do not install the Bally Professional Arcade near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, moisture, mechanical vibration or shock.
2. Allow adequate air circulation under the Arcade to prevent heat build up. **Do not block vents by operating the Arcade on a carpeted surface.**
3. Do not open the Bally Professional Arcade cabinet as it will void your warranty. There are no user serviceable parts inside.
4. To disconnect the cord, pull it out by the AC adapter housing. Never pull the cord itself.
5. Save the original shipping carton and packing materials. If you ever need to ship your set, the original carton will help prevent damage to your Arcade.

FCC REGULATIONS

Please note the FCC regulations which prohibit the following:

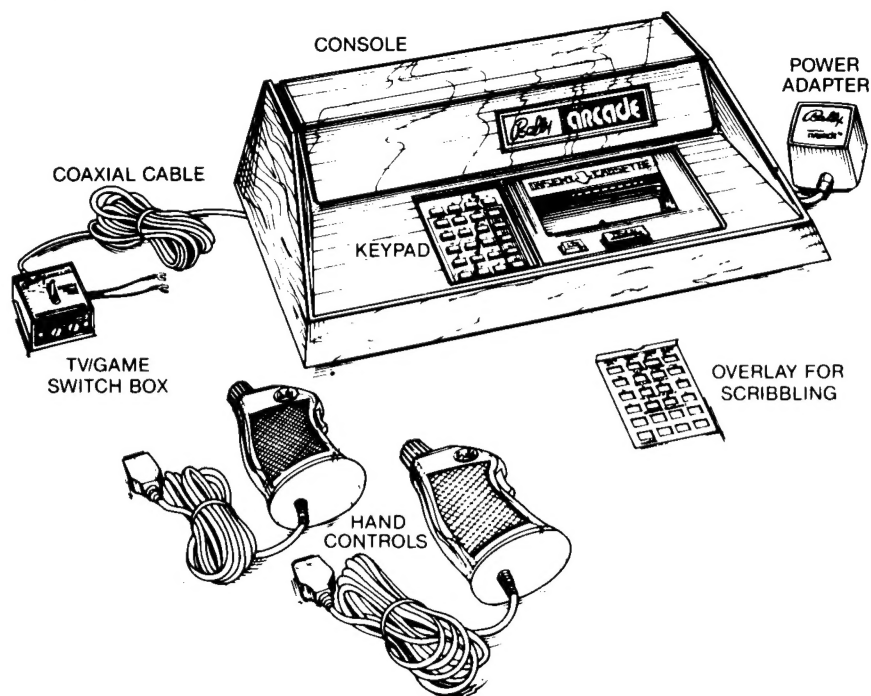
1. The use of additional flat lead in from the TV/game switch box to your TV receiver.
2. Connecting any additional TV receivers to the TV/game switch box.
3. Connecting the Bally Professional Arcade directly to your TV antenna or cable TV connector. All connections are to be made through the TV/game switch box.

Violations of these rules could cause interference to other TV receivers in your area.

Also see In Case of Difficulty, page 19.

BALLY PROFESSIONAL ARCADE

The following sections describe the procedure for setting up your Arcade and connecting it to your television set. Please compare the illustrations to your own system and read the instructions carefully.



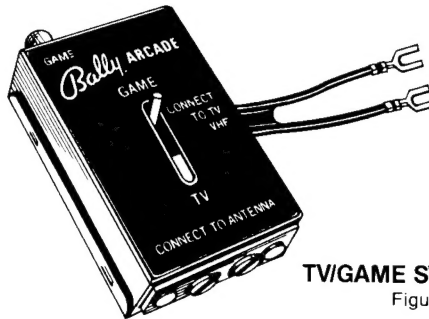
BALLY PROFESSIONAL ARCADE

Figure 1

TV/GAME SWITCH BOX

The TV/game switch box included with your Bally Professional Arcade enables you to select regular television programming or Arcade games by simply moving the selector switch to the mode desired.

By comparing the back of your television set with the following two illustrations, check to see which set of instructions apply to you. If you have 300 ohm ribbon type flat lead into the VHF antenna terminals, go to the next section entitled 300 ohm installation. If you have 75 ohm round coaxial cable into the VHF antenna jack, go to the following section on 75 ohm installation.

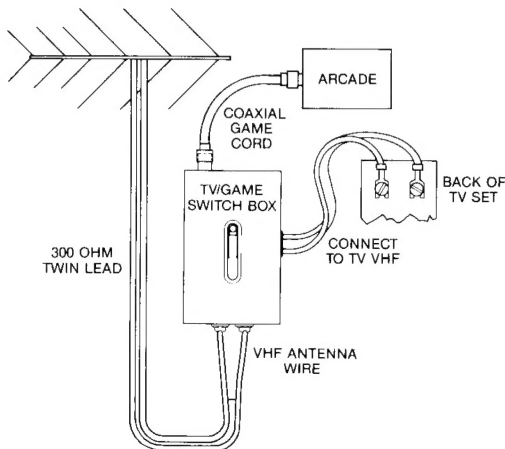


TV/GAME SWITCH BOX

Figure 2

300 OHM INSTALLATION

1. Locate the VHF antenna terminals on the back of your television receiver. Remove the existing lead in wires connected to these terminals and attach them to the terminals marked "Connect to Antenna" at the base of the TV/game switch box.
2. Connect the short length of antenna wires coming from the side of the TV/game switch box to the VHF antenna terminals of your TV receiver.



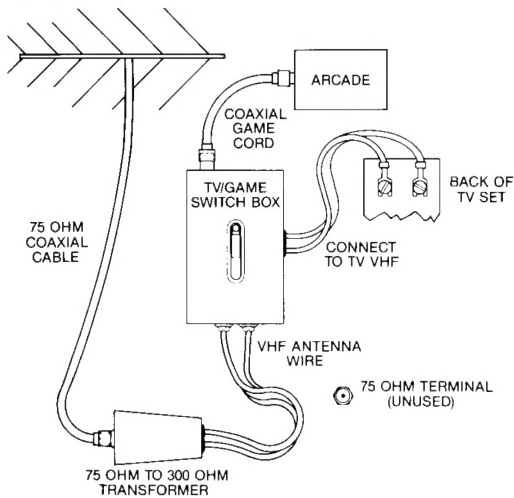
300 OHM TWIN LEAD INPUT

Figure 3

75 OHM INSTALLATION

Note: With this system it will be necessary to supply a 75 ohm to 300 ohm matching transformer. This can be obtained from your dealer or any television service center.

1. Remove the coaxial connector from the back of your TV receiver and connect it to the matching transformer.
2. Connect the 300 ohm flat twin lead (from the matching transformer) to the terminals marked "Connect to Antenna" at the base of the TV/game switch box.
3. Connect the short length of the antenna wires coming from the side of the TV/game switch box to the VHF antenna terminals of your TV receiver.

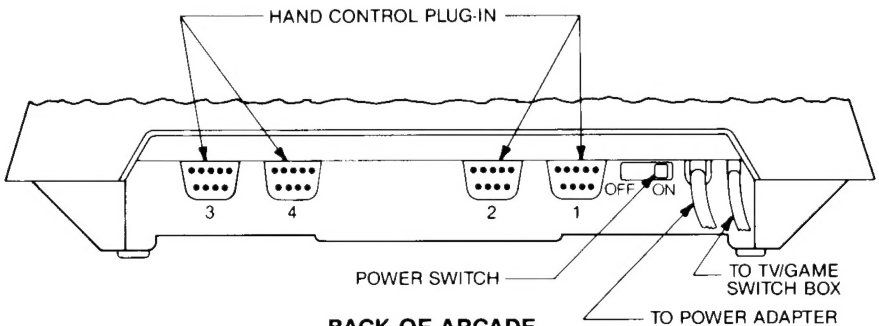


75 OHM COAXIAL CABLE INPUT

Figure 4

CONNECTING ARCADE TO TV RECEIVER

Carefully unroll the coaxial cable from the Arcade console and plug it into the connector on the TV/game switch box marked GAME. Then, plug the power adapter into a 120 VAC outlet.



BACK OF ARCADE

Figure 5

CONNECTING HAND CONTROLS

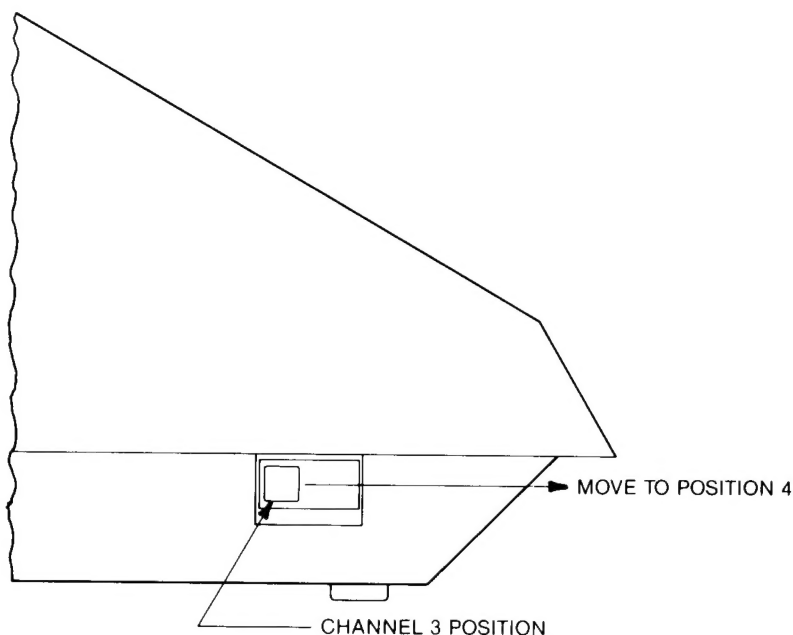
The Bally Professional Arcade comes with two hand controls. Each one is numbered on the top of its knob to indicate player #1 and player #2. Additional hand controls may also be purchased for three and four player games.

Plug each hand control into its appropriate connector on the back of the Arcade. Hand control #1 should be inserted into the first jack on the back left side. From left to right (as you face the front of the Arcade), the jacks connect to players 1, 2, 4, 3, respectively.

CHANNEL SELECTOR

With the Bally Professional Arcade, channel 3 or 4 on your television receiver may be used to play the video games. This feature is important because it minimizes the potential for interference if a particular channel is active in your area.

To select a locally inactive channel, locate the channel selector contained in the compartment on the left side panel as you face the front of the Arcade. Note the position of the switch. If channel 3 is in use in your area, the switch should be set to the channel 4 position. Reset the switch if necessary.



CHANNEL SELECTOR

Figure 6

SWITCHING ON ARCADE AND TV

The on/off switch for the Arcade is located on the back left side of the console. Slide the switch to the left (as you face the front of the Arcade) to turn on the power.

Once you have selected either channel 3 or 4 on the Arcade, switch on your television set and turn to that channel. (Please make sure the TV/game switch box selector is in the game position.)

ADJUSTING TV SCREEN

If the selected TV channel is not normally used, it may be badly out of focus; therefore, adjust the fine tuning as follows:

1. If your TV is equipped with an AFC/AFT button, turn it off to release the automatic fine tuning circuitry. Otherwise, proceed to step 2.
2. Adjust the fine tuning knob clockwise until a herringbone pattern appears in the colored parts of the picture. Then, turn the knob slowly counter-clockwise. Release it at the point where the herringbone pattern just disappears and the picture is clear. This is the correct tuning point.
3. Turn the AFC/AFT button to on in order to reactivate the automatic fine tuning circuits.

ARCADE WARM-UP INSTRUCTION

During the first few minutes of operating your Bally Professional Arcade, a random pattern may appear on your TV screen. If this occurs, simply press the RESET button to clear it. It may even be necessary to turn the power switch off then on again to completely clear the circuit.

Due to sophisticated circuitry operation, this condition may occur until the unit has reached its stable operating temperature.

MAIN MENU SELECTION

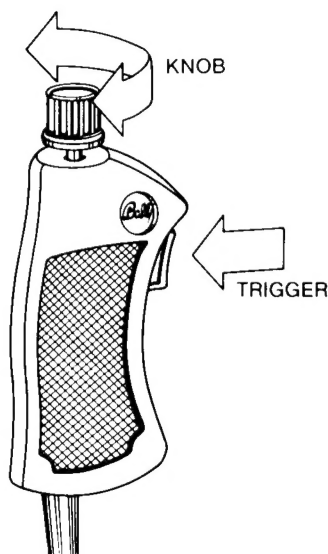
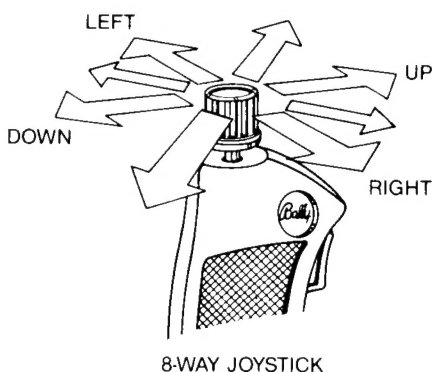
The Bally Professional Arcade comes with a selection of three video games and a 5-function, 10-memory calculator. With these programs, you can begin using the Arcade as soon as you set it up. After you have made your connections and your unit has been turned on, press RESET and the following menu should appear on your screen:

- 1 - GUNFIGHT
- 2 - CHECKMATE
- 3 - CALCULATOR
- 4 - SCRIBBLING

Instructions for playing these games will be provided later in this manual. Each player will need to have access to a hand control in order to play the games. In addition, players may choose to use the remote game selection feature rather than entering numbers on the keypad.

HAND CONTROL OPERATION

Each hand control is made up of three different parts—a knob, a joystick and a trigger. The functions of these parts vary from game to game.



HAND CONTROLS

Figure 7

The knob on the top of the hand control can be turned to the left or to the right. When playing Gunfight, rotation of the knob moves the position of the gunfighter's hand.

The joystick can be moved in eight directions, such as, forward, backward, side-to-side and at 45 degree angles. These motions determine the movement of the image angles; for instance, in Checkmate, the joystick is used to move your symbol horizontally, vertically and diagonally.

When the trigger is pulled, a switch is activated which controls part of the game action; for example, the trigger is used for shooting in Gunfight or placing a trace on the screen in Scribbling.

REMOTE GAME SELECTION

The Bally Professional Arcade provides you with the convenience of remote game selection. All of the keypad entries required to start a game may be made using the hand control connected in the #1 position.

Remote game selection is easy, and only three steps are involved. Let's play Checkmate as an example.

1. When the main menu is displayed on the screen, pull the trigger once. A number will appear on the lower left corner of the TV screen.
2. Turn the knob on the hand control to change the number. Adjust the knob until the number of the entry you want is shown. For Checkmate, this number would be 2.
3. Pull the trigger again. This time it will register your choice with the Bally Professional Arcade.

The Arcade will now ask you to "ENTER # OF GAMES." Press the trigger once for remote game selection. Adjust the knob to indicate the number of games you wish. Register your choice by pressing the trigger.

Now follow the same three step sequence to enter the number of players.

When a game is over, you may select another game by pulling the trigger to obtain the main menu. (Note: If you pull the trigger too quickly, it will erase the final score of the game.) Then, pull the trigger, adjust the knob and pull the trigger again to enter your choices.

TELEVISION TUBE PROTECTION CIRCUIT

It has been said that video games may harm your television tube if left on for excessive periods of time. This is not true of the Bally Professional Arcade. If left unattended for approximately four minutes, the Arcade will blank the screen and prevent any burned-in images. Press any key on the keypad or use the hand control to resume operation. (Note: There may be occasional exceptions to this protection circuit feature.)

PAUSE

To pause in the middle of a game, press the clear (C) key to blank the screen. Press the clear (C) key again to resume at the exact point at which you blanked the screen. (Note: As with the protection circuit, there may be occasional exceptions to the pause feature.)

USER-PROGRAMMABLE GAME TIME

You are not limited to a prescribed length of time or fixed scores when playing the Arcade games. With the use of the keypad, you can program most games to a score of 1 to 99 or from 1 second to 10 minutes in length.

BUILT-IN PROGRAM INSTRUCTIONS

Your Bally Professional Arcade has three built-in games and a calculator. Please read the following instructions to learn their operation.

GUNFIGHT

Gunfight is a very popular arcade game for two players. You have complete control over your gunfighter's movements as you attempt to gun down your opponent before he or she gets you. To add to the fun, different objects appear on the screen between the gunfighters. Your gunfighter will be able to hide behind cacti, trees and even a moving, covered wagon.

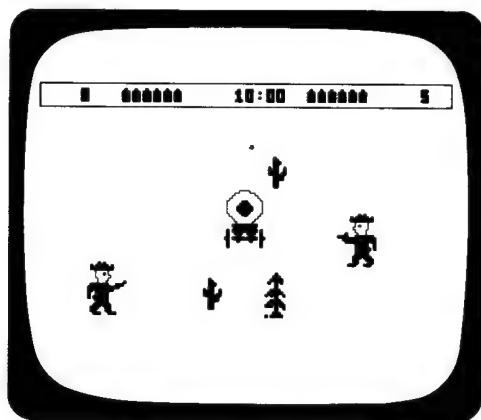
Select this game by pressing 1 on the keypad or pulling the trigger on hand control #1, turning the knob until 1 appears on your TV screen, then pulling the trigger again. This informs the Arcade that you wish to play Gunfight.

Then, enter the score to which you would like to play. When playing to a score of less than 10, you will need to enter an equal sign (=) to begin play.

Gunfight utilizes hand controls #1 and #2. The functions of the hand controls are:

Joystick	Walks your gunfighter around the screen.
Knob	Raises and lowers his arm.
Trigger	Shoots.

At the top of your TV screen, the Arcade will indicate each player's score and the number of bullets remaining. In addition, a 10-second timer will be shown after either player uses all six bullets. Each "scoring set" will have different objects appear on the screen. Aim carefully! You may use up all your bullets by cutting down the tops of trees!



GUNFIGHT

Figure 8

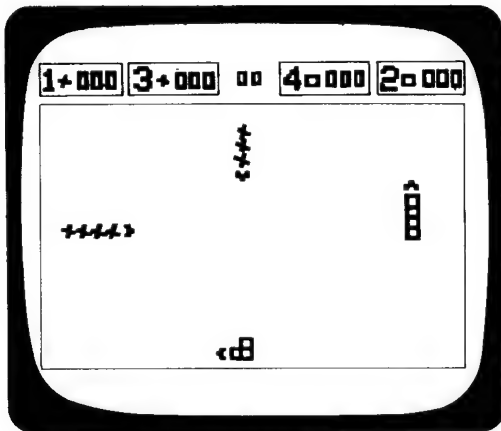
CHECKMATE

The object of Checkmate is to cause your opponent to crash into your trail, his own trail, or the sides of the playing field. Every time you outlast one of your opponents, you receive one point. For example, in a game with four players, the first player to be eliminated scores zero, and the remaining three score one point each. The next player eliminated also scores zero, and the remaining two players each score another point. After all other players have been eliminated, the remaining player will have scored three points— and the game is over.

To select Checkmate, press 2 on the keypad, or pull the trigger on hand control #1, turn the knob until 2 appears on the screen and pull the trigger again. You are now ready to play Checkmate.

Then, using the keypad or hand control #1, enter the number of games you wish to play. When playing less than 10 games, you must press the equal sign (=) to begin play.

Finally, enter the number of players. If you enter 0, the Arcade plays by itself. If you enter 1, four characters appear and you play against the Arcade (you control symbol #1). Enter 2, 3 or 4 and the corresponding number of symbols will appear.



CHECKMATE

Figure 9

In the box at the top of the TV screen, the Arcade shows each player's number and symbol, as well as the number of games remaining.

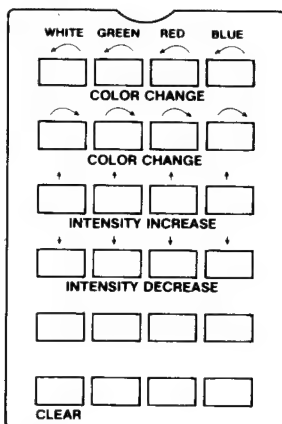
When the game begins, the symbols move automatically. You can change the direction by using the joysticks to move horizontally, vertically and diagonally. If you try to move backwards, it's an instant crash! For this game, the knob and trigger have no function.

A key strategy is to fence off as much of the screen as possible. That way, your opponent has no choice but to crash into your trail or his own. Games are fast-paced and exciting—especially with the great Arcade sounds.

SCRIBBLING

Scribbling turns your TV into a color drawing tablet. You can have hours of fun with this fascinating, creative game. By manipulating the various controls, you can create a multi-color pattern on your TV screen and draw or write almost anything you choose.

Press 4 on the keypad (or select 4 using remote control) to play Scribbling. Then, enter 0, 1, 2, 3 or 4 for the number of people who wish to play. If you enter 0, the Arcade will draw intricate patterns on the screen while you watch.



SCRIBBLING OVERLAY

Figure 10

Place the plastic overlay provided with your unit over the keypad. There are 256 colors obtainable with Scribbling. To change the color of the picture on your TV, use the keys on the keypad as follows:

(Top to Bottom, Left to Right)

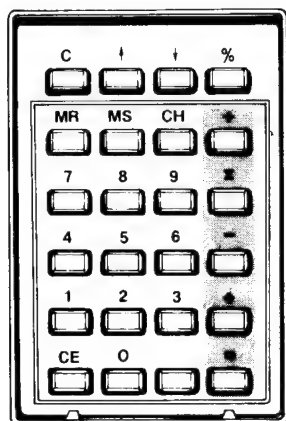
Top Row	Mixes amount of white, green, red, blue.
Second Row	Reverses color changes of above.
Third Row	Increases intensities.
Fourth Row	Decreases intensities.
Fifth Row	No function.
Sixth Row	First key (clear) clears the screen; all others have no function.

In addition to the keypad functions, the hand control is used in the following ways:

Joystick	Moves cursor in eight directions.
Knob	Increases size of cursor and changes color from white to green to red to blue.
Trigger	Places a trace on the screen as you move the joystick.

CALCULATOR

Not only does the Bally Professional Arcade contain three great games, but it also has a 5-function, 10-memory calculator that will store and scroll up to 92 entries on your TV screen.



CALCULATOR FUNCTIONS

Figure 11

To select the calculator, enter 3 on your keypad (or use Hand Control #1 to select 3 by remote control).

You should now see a horizontal gold bar at the bottom of your screen. This gold bar is used to display the present entry and answer.

Similar to other calculators, this one allows you to add, subtract, multiply, divide and figure percentages. The keypad functions for the calculator are:

- | | |
|--------------------|--|
| (C) Clear Key | Removes all previous calculations including memory storage. |
| (CE) Clear Entry | Removes only the last entry from display. |
| (CH) Change Sign | The CH key changes the sign of the displayed number. Negative numbers will appear in red. |
| (MS) Memory Store | Adds displayed number to memory; 10 individual entries to memory storage can be made. Each time the MS key is used, it should be followed by pressing the appropriate number key (1, 2, 3, etc.) to select the desired storage register. |
| (MR) Memory Recall | Recalls number in memory to display. Must be followed by appropriate number key to secure correct memory from storage. |
| (^) Scroll Up | Moves video tape forward. |
| (v) Scroll Down | Moves video tape backward. |
| (.) Decimal | Enters a decimal point. |
| (%) Percentage | Calculates a percentage of the previous entry. |

To learn to use the keypad, enter the following problem:

$$8 + 6 - 5 \times 16 - 8 =$$

After you have solved this problem, continue making entries until the first few numbers begin to slide off the screen. At this point, press the scroll backward key (↑) until the top digit reappears. Now press the scroll forward key (↓) and return to the point where you left off.

You can store up to 92 line entries on this problem stack. Numbers should not be entered when the screen is scrolling up or down, as those numbers will be omitted. If your problems go over the 92 line limit, numbers at the top of the stack will be lost as new data is entered.

INSERTING VIDEOCADE CARTRIDGES

Whenever you insert videocade game cartridges into the Arcade, the preceding four programs will generally be the last four listed on the main menu of games. To load a new cartridge, follow these instructions:

1. Insert the cartridge, label side up, so that the long, open slot faces into the Arcade.
2. Press the RESET button, and the menu of games will be displayed.

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient the receiving antenna.
2. Relocate the computer with respect to the receiver.
3. Move the computer away from the receiver.
4. Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems."

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00345-4.

BILLING CODE 6712-01-M

"WARNING: This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception."

IN CASE OF DIFFICULTY

Your Bally Arcade has been rigorously tested and thoroughly inspected prior to shipping, and it is unlikely that you will experience any difficulty with its operation. However, if you suspect that a problem exists, the following chart will help you resolve it or determine its cause. To use the chart, locate the symptoms under the **PROBLEM** heading, determine what it might be **CAUSED BY**, then read and perform the **POSSIBLE SOLUTIONS**.

PROBLEM — No picture or sound. "Hiss" and "Snow" as if between stations.

CAUSED BY: **POSSIBLE SOLUTIONS**

- a. No outlet power. Check for a loose connection or no power at the AC outlet. Plug a lamp into the same outlet to verify that power is present. Check for bent prongs on the wall transformer.
- b. Improper antenna connection. Verify that the TV/GAME switch box is properly connected to the VHF antenna terminals on your TV set and that the switch is all the way in the GAME position. Make sure that the cable has not come loose from the switch box.
- c. Channel switch improperly set. Ensure that the channel selected on the TV corresponds to the channel switch setting on the Arcade. Try fine-tuning the channel slightly. Also check to be sure that the channel you have selected is not being broadcast in your area.
- d. Defective power supply or RF modulator. Verify that the ON/OFF power switch on the back of the Arcade operates freely (about 1/4 inch travel) and that it is in the outward-most (ON) position. If power is on at the wall receptacle and no change in picture or sound occurs when the Arcade is switched from OFF to ON, a defect exists.

PROBLEM — Fuzzy picture or strong interference. Buzzing sound changes with picture.

CAUSED BY: **POSSIBLE SOLUTIONS**

- a. Improper antenna connection. See 1b. Check the antenna wires (outside or rabbit-ears) to make sure they have been properly connected to the antenna screws on the TV/GAME switch box. Verify that the 300 ohm VHF antenna input was used when connecting to your TV set.
- b. Channel switch improperly set. See 1c.
- c. RF modulator adjustment. If tuning in a satisfactory picture results in a buzzing sound that changes with the picture content, a simple adjustment to the RF modulator inside the Arcade may cure this problem. **DO NOT ATTEMPT TO MAKE THIS OR ANY ADJUSTMENTS TO THE RF MODULATOR.** Refer this adjustment to your authorized service center. Note that a similar misalignment in your TV set can also cause this problem.

PROBLEM — Dark screen or random patterns on screen.

CAUSED BY: **POSSIBLE SOLUTIONS**

- a. Low power. Make sure that your Arcade is not connected to an overloaded circuit and that you are not experiencing a "brown-out" condition or transient line drop caused by a major motor driven appliance starting up. Your Arcade requires a steady power supply of between 108 and 125 volts.
- b. Incomplete RESET. Your Arcade is designed to reset its internal circuitry and begin BASIC or the game menu whenever either the power is turned on or the RESET button is pressed. Press the RESET button again to clear an incomplete reset operation.
- c. Defective game cartridge or BASIC System cartridge. A game cartridge can become defective when contacting unusually strong static discharge, such as handling the cartridge on a new carpet in very dry weather. Ensure that the cartridge is firmly inserted, then press RESET. If it still does not work, try another cartridge to make sure the Arcade is functioning properly.
- d. Temperature build-up or internal failure. If the problem occurs after a length of operation, the problem may be due to excessive temperature build-up around sensitive internal components. Turn off your Arcade and try it again after it has cooled down (10-15 minutes). Also, an internal component may have become intermittent with use. Refer these problems to your authorized service center for correction.

PROBLEM — Game or BASIC cartridge won't run or partially runs only.

CAUSED BY: **POSSIBLE SOLUTIONS**

- a. Low power. See 3a.
- b. Defective cartridge. See 3c.
- c. Temperature build-up or internal failure. See 3d.

PROBLEM — Hand control erratic or inoperative.

CAUSED BY: POSSIBLE SOLUTIONS

- a. Low power. See 3a.
- b. Defective hand control. Make sure that the hand control is fully connected to the appropriate jack. Try another hand control in the same jack. Check the cord connections for excessive strain or a limp feeling. Test the hand control functions, using a simple BASIC program to PRINT KN(), JY(), TR().
- c. Dirty control. Dust or dirt may collect on the contact surfaces of the knob and trigger. A dirty knob usually causes a jittery response from the hand control. Attach the control to the furthest left jack (#1) and attempt to make a menu selection. If each pulling of the trigger does not cause one step (i.e. from number selection to number recording to number selection, etc.), then the trigger requires cleaning. While using the knob to select the numbers, it should not exhibit excessive flickering between numbers and should easily come to rest at the desired number. If you have trouble selecting numbers, the knob control requires cleaning.
- d. Defective hand control jack. **THE HAND CONTROL JACKS ARE SUSCEPTIBLE TO STATIC DISCHARGE.** — See 3c. Static discharge can damage the hand control jack and cause erratic operation or complete failure of the jack (socket connection). Try different controls in the problem socket to distinguish between a hand control failure and a failure of the connecting jack.
- e. Game design. Certain games, as a by-product of their design, seem at times to favor one control jack over another. For example, inputs from hand control #1 may be processed before inputs from hand control #2. The effect of such designs may cause the #1 control to "feel more responsive" when in direct competition situations. This slight difference may be used as a handicap where the games do not otherwise have selectable skill levels.

PROBLEM — Keypad erratic or inoperative.

CAUSED BY: POSSIBLE SOLUTIONS

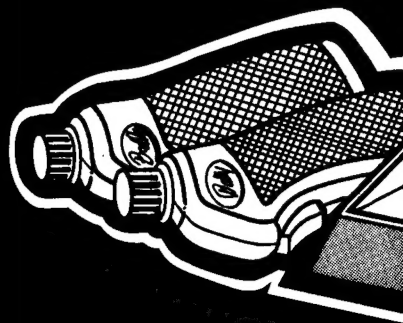
- a. Keys not completely pressed. Like the hand controls, the keypad contacts can exhibit erratic behavior. Make sure that the keys are pressed completely and firmly. This not only provides a better electrical contact but helps keep the contacts clean.
- b. Defective hand control jack. See 5d. The same keypad is electrically connected to some of the same circuitry as the connecting jacks. Damage to the jacks can cause erratic keypad operation, such as displaying unwanted entries from the furthest right column of keys. Check keypad operation with the hand controls removed and then check for non-functional connecting jacks.

PROBLEM — Programs will not load using the BASIC tape interface.

CAUSED BY: POSSIBLE SOLUTIONS

- a. Record/playback volume too low. Most cassette tape recorders contain circuitry which controls the record volume to keep it at optimum level. If your recorder does not have such a feature, make sure that your recorder level is properly set. The proper level is just below the point of distortion. Playback level should be fairly loud—about two-thirds full volume is sufficient. Louder levels may be required if the tape was recorded on a different tape recorder. This is due to losses which can occur because of alignment differences between the two recorders.
- b. Interface connection. Verify that the interface cord between the BASIC System cartridge and the recorder is connected to the proper jack on the recorder: MIC for recording; EAR for loading. The plug cord should be properly connected at both ends. Check the cord by plugging it into another sound system to make sure it is working properly.
- c. Defective tape or recorder. While this interface is designed to be tolerant of playback flutter/wow (up to +25%) and certain amounts of amplitude variations, extreme variations and even drop-outs can occur when using old or low quality tape. If in doubt, record a long period of a steady tone and then listen to the playback. Defects in either the tape or the recorder will be obvious.

(This Page Intenionally Left Blank)



ASTROVISION INC.

6460 Busch Blvd. / Suite 215 / Columbus, Ohio 43229

PRINTED IN U.S.A.

FORM NO. 0620-00303-0000